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RS-6
7-16MC

FOLLOWING PAGES ARE

EXPERIMENTAL COIL CALCULATIONS
USING CONVENTIONAL L-C COMBINATION
AND TAPPING ANTENNA FROM
COIL. PRIOR TO DETERMINING

COIL VALUES FOR FIXED SLUGGED
COIL WITH CONTINUOUSLY VARIABLE
ANTENNA TAP. (IE ROTATING COIL)

STAT

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RJ6 — 7 - 16 MCS

L = 2.5T4 X_{L} 4mcs = .223 Ω

Q unloaded = 104 γ = 2.14 Ω R = Z = 232K Ω

Q loaded 1200 Ω γ = 11.1 Ω R = Z = 4480 Ω

$$\text{Efficiency} = \frac{Q_c - Q_p}{Q_c} = \frac{104 - 20}{104} = \frac{84}{104} = 80.6\%$$

$$\text{Eff}_{600} = \frac{200 - 20}{200} = \frac{180}{220} = 82\%$$

CONCLUSION: AT 14MCS WITH 1200Ω LOAD MAX LOADING WAS Q = 20 = 4480 Ω

IL = 2.5Y

Q unloaded = 104 γ = 2.14 R = Z = 232KΩ

Q loaded 600 last top = 10 γ = 22.3 R = Z = 2250 Ω

STAT

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RS-6 - XMTR P.A.

4.5 MCS

EP = 375 V

	Ip	Ea	TAP	TOTAL	RATIO	Po
	62	92	17.5	41	2.34	14.1
	60	90	16.5	37.5	2.3	13.5
Z TOO LOW	62	86	14	30	2.1	12.3
	60	88	10	25	2.5	12.9
	62	87	10	24	2.4	12.6
✓	60	90	20	48	2.4	13.5
Z TOO HIGH	60	88	17	46	2.7	12.9
✓	60	90	17.5	43	2.4	13.5
	61	90	17.5	42	2.4	13.5

OPTIMUM RATIO 2.3 $\frac{N_T}{N_{LOAD}}$

$\left(\frac{N_T}{N_{LOAD}}\right)^2 \times Z_L = Z_T$; $(2.3)^2 \times 600 = 3180$

STAT

X = 318 Ω @ 4.5 mc

L = 11.25 uh

C = 250

	RATIO	Po	Z	d	X	Q
41	2.34	14.1	3300	14.5	~~340~~ 410	~~9.6~~ 8.1 ✓
37.5	2.3	13.5	4550	11.2	318	14.3 ✓
3.0	2.1	12.3	2659	8.9	251	10.5 ✓
25	2.5	12.9	3760	7.4	210	17.9
24	2.4	12.6	3410	7.1	200	17.3
48	2.4	13.5	3450	14.3	405	8.5
46	2.7	12.9	4400	13.7	388	11.3
43	2.46	13.5	3680	12.8	362	10
42	2.4	13.5	3410	12.5	354	9.75

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T	RATIO	Z	P_o	Q	Y	R
2V	2.4	3450	13.5	17.3	11.55	
2.5	2.5	3760	12.9	17.9	17 Ω	
3.0	2.1	2650	12.3	10.5	24 Ω	
3.5	2.3	4550	13.5	14.3	22.3 Ω	
4.1	2.34	3300	14.1	8.2	36.5 Ω	3401 / 3350
4.2	2.4	3450	13.5	9.75	36.4	
4.3	2.46	3630	13.5	10.	36.2	
4.6	2.7	4400	12.9	11.3	34.6	
4.8	2.4	3450	13.5	8.5	47.7	

CONCLUSIONS

2 CENTERS ABOUT 3300 Ω FOR OPTIMUM Q AND POWER OUTPUT X = 345 Ω F = 4.5 MC L = 12.2 uh

ACTUAL COIL = 14.5 uh; X = 410

Eff = Coil = 12.2 uh X = 345 Ω / 65 Ω $X_C = \frac{1}{2\pi FC}$ $C = \frac{1}{2\pi F X_C}$ $\frac{1}{1.8 \times 10^6}$

$C = \frac{10}{1.8} \times 10^{-10}$

$C = 5.55 \times 10^{-10}$

4.5 CRYSTAL SERIES IMP = 10 Ω C = 5.55 uf ?

2.3 uh

Trial Coil L 14.1 Q = 161 STAT

Ratio = 2.34 $\frac{N_T}{N_{Load}}$ = 26 $\frac{24}{2.34}$ = 11 T TAP (600 Ω)

I_p = 53 I_T 68 ma P_o 90 V E_p = 375

800 2.7M ISO E_{DRIVE} 22 Eff 60% P_o = 13.5 W 11 TAP

I_p = 58 I_T = 70 ma P_o = 92 E_P = 375 10.7

E_{DRIVE} 63% 14.1 W 11.75 TAP

KED DOW I_p = 60 P = 98 E_p = 400

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600 Ω. ANT LOAD. 1-24-52

@ 3 mc — EP - 400

	Ip	Ea	TAP -	TOTAL TURNS
400	65	92	17.5	41
375	62	89	17.5	41

14.5 mh.

Q METER — 41 TURN COIL

C = 197 mmf Q = 145 @ 3 mc. U.L.

197 mmf Q - 18 @ 3 mc L -

CALCULATE Z FOR Q OF 5

RE CAL. Z FOR Q OF 10

RE CAL L

4.5 mc. EP = 375

	Ip	Ea	TAP	TOTAL T	Po.
	62	92	17.5	41, 145	14.1 W
		EP. 400			
	70	99	17.5	41 = 2.3y	16.3 W
		EP. 375			
	60	90	16.5	37.5	2.3 || 3.5
	62	86	14.0	36 (2.1)	
	60	88	10	25	12.9
	62	87	10	24	2.4 STAT
	60	90	20	48	
	60	88	17	46	
	60	90	17.5	43	
	61	90	17.5	42	

Q METER - @ 4.5 MCS.

69 mmf Q - 5 @ 4.5 - L 41 COIL

69 mmf Q = 125 U.L. L = 15.8 mh

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$f = 4.5$ mc.

$L = 15.8$ mh

$Q = 5$

PLATE TANK CKT.

X_L: 446 Ω

Z: $5 \times 446 = 2230$ Ω

$\frac{446}{5}$: 89.2 Ω : R

R: $89.2[1 + 25]$: 89.2×26: 2320 Ω. ? Q

$Q = 125$

$\frac{446}{125} = 3.57$ Ω

R: 3.57 [illegible]

$\frac{E_1}{E_2}$; $\frac{N_1}{N_2} = \sqrt{\frac{Z_0}{Z_1}}$ $\left(\frac{N_1}{N_2}\right)^2 = \frac{Z_0}{Z_1}$

$\frac{42}{17.5} = 2.4 = Z$

$2.4^2 = 5.77 = \frac{Z_0}{Z_1}$

$5.77 = \frac{Z_0}{1600}$

$Z_0 = 5.77 \cdot 600 = 346200$ Ω

STAT

$\frac{E_1}{90} = \frac{42}{17.5} = 2.4$

$E_1 = 2.4 \cdot 90 = 216.0$ V ERMS.

$\left(\frac{216}{90}\right)^2 = 2.4^2 = 5.76 \cdot 600 = 3456.00$

$Q = \frac{Z_0}{X_L} = \frac{3460}{446} = 7.75$? 60. Ω

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Assume Q = 8 Z = 3500 Ω

$QX = Z$

$10 = 3500 \quad Z$

$Y = 350$

2900 12.4

$(2.5)^2 \times 600 =$ 3750

2.4
2.5
2.1
2.3
2.3
5 | 11.5
2.3

$(2.3)^2 \times 600$ 3180

3180

Q192 − 11.25 L

$\frac{N_1}{L} = \frac{33.25}{11.25} = \frac{41}{L}$

33.25 2.3

$\frac{N_T}{N_L} = 2.3 \quad \frac{33.2}{x} \quad 2.3 = 14.5$ T mm Tap

Unloaded Q = 142 C = 100 mmf

STAT

$6.28 \times 4.1 \times 10^6 \times 6.5 \times 10$

$= 1184 \times 10^7$

5.55×10^{-10}

$\frac{.65}{\text{air}} \quad \frac{6.5}{6.28 \times 4.1 \times 10^{-6}} = 2.3$ uh

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Q 18 600 TAP # 4

Q24 600 TAP # 3

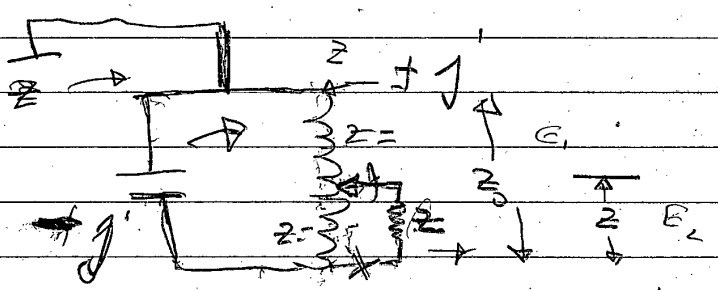
Q.

Q =

$Z = X_L Q_{mea}$

$\left(\frac{E_1}{E_2}\right)^2 = \frac{Z}{Z_0}$

$\left(\frac{E_1}{E_2}\right)^2 Z_0 = Z$


Z
Z
Z

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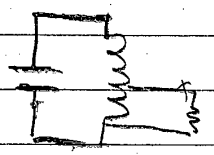
2000 - 1700 - 1400 3.v

- 13. m/h.



$Z = QX$

$Z_p = Q_p X$

$Q_p = \frac{X_L}{R_p}$ $Q = \frac{X_L}{R}$

$\frac{Q_p}{Q} = \frac{R}{R_p}$

$R = r\left[1 + \left(\frac{\omega L}{r}\right)^2\right]$

$L = 9.54$ mh

$Q = 104$ 14 mcs

$Q_p = 20$ ~~shunt~~ tap.

$Q_p = 30$ ~~shunt~~.

$Q_p = 42$ 3 ~~shunt~~

$Q_p = 56$ ~~X~~ tap

$Q_p = 74$

$Eff = \frac{Q_c - Q_p}{Q_c}$

$Q = 104 = \frac{X_L}{R}$ $\frac{223}{R}$

$R = \frac{223}{104} = 2.14\Omega$

$R = 2.14\left[1 + 104^2\right]$

1.08×10^4

$R = 2.32 \times 10^4$ $232\,1\Omega$

$Q = 20 = \frac{X_L}{R} = \frac{223}{r}$

$r = \frac{223}{20} = 11.1\,\Omega$

$R = 11.1\left[1 + 400\right]$

$R = 11.1 \times 400 = 4.48 \times 10^{-3}$

$R = 4440\,\Omega$

$Q = \frac{223}{r}$

22.3

$R = 22.3\left[1 + 100\right]$

$R = 2230\,\Omega$

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$$\begin{bmatrix} R^2 \times R_1 = Z_1 & 300 \\ R^2 \times R_2 = Z_2 & 700 \end{bmatrix}$$

$$R \times 600 = 3000 \qquad \frac{Z}{Z} \qquad Q \qquad \frac{11.25}{33.25}$$

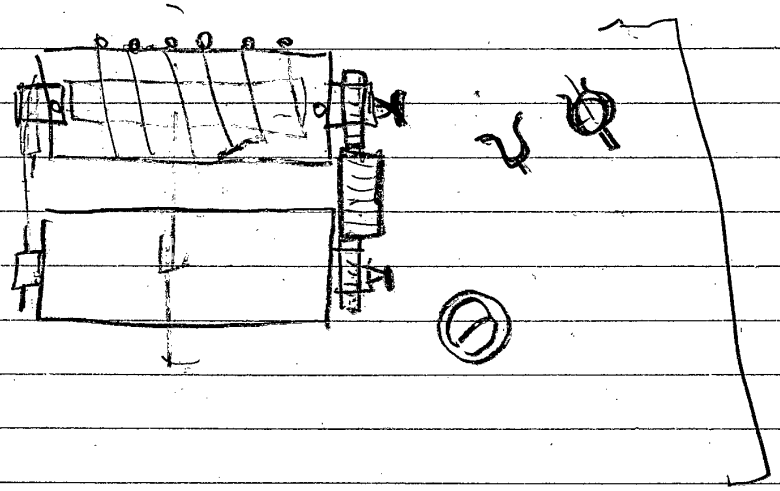
$$\left(\frac{21}{8.1}\right)^2 600 = 3660$$

$$\frac{4.5}{9} \qquad \frac{21}{11.3} \qquad \frac{22}{10}$$

7.6

$f = 9.\text{MC} \quad Z_a = 600$

T_{AP}	I_b	E_{g_a}	E_g	E_b	I_{TOT}
8.8	53	8V	−3.0	375	66



STAT

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